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ABSTRACT

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Monthly collections of zooplankton were made between March and November of 1966, 1967 and 1968 from 26 lakes in the Algonquin Park area of Ontario. The lakes range from 2.9 ha to 302.1 ha with the majority (22) less than 50 ha in area. Natural brook trout populations occur in 6 lakes and hatchery-reared brook trout are planted annually in 16 of the other lakes.

Fifty-eight species of zooplankton were identified, many of which were new records for the area. The crustacean zooplankton composition was markedly similar to that reported from other areas of North America.

No marked seasonal changes in zooplankton composition occurred in the course of each year of the observations. There were, however, certain obvious seasonal changes in the relative zooplankton abundance as a whole. The occurrence and the number of peaks of zooplankton abundance and their duration varied somewhat from lake to lake as well as from year to year. No definite correlation between physical characteristics of the lakes and the peaks of zooplankton abundance was established.

Keywords: Zooplankton, brook trout lakes, Algonquin Park.

ZOOPLANKTON IN BROOK TROUT LAKES OF ALGONQUIN PARK, ONTARIO

INTRODUCTION

This paper lists the zooplankton species of 26 lakes in the Algonquin Park region of Ontario. These lakes are representative of (a) waters supporting reproducing populations of native brook trout *(Salvelinus fontinalis)* and (b) waters, generally smaller in area, in which hatchery-reared brook trout are commonly planted. Presently, information on the composition and distribution of the zooplankton of lakes in this area is meagre and this paper is intended to serve as a "baseline" for future studies.

Solman (1939) found 29 species of Cladocera and 8 species of Copepoda in Costello Creek. Price (1955) studied the differences in seasonal abundance among 4 species of Cyclopidae *(Cyclops scutifer, Cyclops bicuspidatus, Mesocyclops edax, Tropocyclops prasinus)* in the plankton of Clarke Lake. He also noted the presence of *Cyclops bicolor, Eucyclops agilis,* and *Macrocyclops albidus,* which he referred to as "sedentary" species. The direct effect of wind on plankton distribution in Clarke Lake was studied by Langford and Jermolajev (1966). Some quantitative data on zooplankton in relation to fertilization experiments in several lakes was presented by Langford (1950) and Price (1951). Martin and Chapman (1965) found the glacial relict planktonic crustaceans *(Limnocalanus macrurus, Senecella calanoides)* in small deep lakes situated in those areas of the Park which had been covered by Pleistocene glacial waters. Sandercock (1967) investigated the coexistence of *Diaptomus oregonensis* and *Diaptomus minutus* in Clarke Lake and described the distribution of *Diaptomus sanguineus* in that lake as well. Rigler and Langford (1967) reported on the distribution of *Diaptomus sicilis* in Round Lake, situated just east of Algonquin Park.

METHODS

STUDY AREA

The study lakes are located mainly in the southern portion of Algonquin Park and in several adjacent townships outside the park. They are scattered over 5 major river systems (Petawawa, Madawaska, Opeongo, Bonnechere, Oxtongue) which originate in this headwater area. Certain morphometric, physical, chemical and biological characteristics of the study lakes were described by Fraser (1963, 1968, 1972). These data, along with data on file at the Harkness Laboratory of Fisheries Research, are given in Table 1.

The lakes range in area from 2.9 ha to 302.1 ha with 9 lakes less than 10 ha, 13 lakes in the 10-50 ha class and 4 lakes exceeding 50 ha. Maximum depths ranged from 4.6 to 42.6 m with the majority of lakes (19) less than 15 m deep. Water colour varied from light yellow to dark brown. Secchi disc visibilities in most lakes were less than 5 m but Crystal and Westward Lakes were much clearer (9.1 m and 8.7 m, respectively). Surface water ranged from 5.9 to 7.2 in pH (Hach kit) with 22 lakes less than 7.0. The poor supply of nutrients from the granitic rocks and relatively poor soils of the area is reflected in the low mineral content of the lake waters. Determinations of total alkalinity and total dissolved solids ranged from 7-15 ppm and 24-54 ppm, respectively.

All water samples were forwarded to the Ontario Water Resources Commission for analyses for total dissolved solids and total alkalinities. All determinations were made as outlined in Standard Methods for the Examination of Water and Wastewater (Am. Pub. Health Assoc., 1960) with the exception of certain minor modifications. Water samples for total dissolved solids determinations were evaporated at 103°-105°C. The residue consisted of all dissolved material plus filtrable colloids where these were present. Total alkalinity was determined using the methyl orange indicator method.

Thermal stratification is well pronounced in all lakes by mid-summer. However, in the shallower lakes with greater area the descending thermocline reaches the bottom by the end of the summer. Surface temperatures are in the 20-23°C range in summer when temperatures in the hypolimnion are 5-10°C.

The study lakes varied widely in their fish species composition. Cyprinid species resided in all the lakes, white suckers *(Catostomus commersoni)* were found in 18 lakes and yellow perch *(Perca flavescens)* were noted in 5 lakes. Miscellaneous species included lake trout *(Salvelinus namaycush)*, pumpkinseed *(Lepomis gibbosus)* and brown bullhead *(Ictalurus nebulosus)*.

In 1966 and 1967 plankton collections were obtained by making vertical hauls near the centre of the lake with a standard Wisconsin plankton net made of No.10 nylon bolting cloth, 50.8 cm in diameter. Hauls were made from bottom to surface except in several deeper lakes where the haul was made from a depth of 15.2 m to the surface. Sampling was continued in 1968 when a smaller net made of No. 20 bolting cloth with a diameter of 25.4 cm was used. Most of the samples were collected from May to September but samples taken in March, April and November were also available.

Twenty lakes were investigated extensively with collections of plankton being made at monthly, and in some lakes at bi-weekly intervals, whereas only single samples were obtained from each of the remaining six lakes (Bruce, Chewink, Crystal, Fair, Hidden and Little Mykiss). Organ-

Table 1. Characteristics of the study lakes

Lake	Area (ha)	Maximum depth (m)	Mean depth (m)	Secchi disc visibility (m)	pH[a]	Total[a] alkalinity (ppm)	Total dissolved[a] solids (ppm)
Animoosh	90.7	8.5	4.0	3.8	7.0	14	24
Billy	93.0	8.5	4.6	4.7	6.7	12	47
Bruce	5.6	7.0	-	1.8	7.0	-	-
Chewink	24.3	5.2	-	3.4	-	-	-
Crevice	25.5	18.3	6.1	4.9	6.8	11	44
Crystal	36.5	15.2	4.3	9.1	6.4	8	40
Dove	6.2	8.8	-	1.8	7.0	-	-
Fairy	20.6	4.6	-	1.5	-	-	-
Hidden	17.0	10.1	-	3.7	-	-	-
Jack	22.3	18.2	-	7.3	6.3	9	33
Little Major	2.9	11.0	4.8	2.5	5.9	7	35
Little Minnow	8.9	14.3	5.2	3.5	6.0	9	44
Little Mykiss	9.3	6.7	2.7	2.1	6.5	9	47
Lonesome	3.6	6.4	2.8	2.7	6.5	-	-
Major	26.3	14.6	7.3	4.8	7.2	15	54
Mykiss	23.5	11.3	5.5	4.1	6.8	8	48
Myra	5.5	8.5	3.0	4.5	6.3	8	28
Oram	27.1	18.3	5.2	4.4	6.8	13	42
Pine	15.8	11.9	4.6	3.0	6.8	11	40
Redrock	302.1	21.3	8.8	3.7	6.9	12	39
Ryan	49.8	11.6	4.0	5.2	7.1	15	45
Sawlog	6.3	8.5	4.3	4.3	6.7	9	33
Scott	27.5	24.1	-	6.0	6.5	7	36
Shallnot	9.3	7.3	3.0	2.1	6.5	8	36
Shrew	34.8	9.1	5.5	4.5	6.8	12	28
Westward	62.4	42.6	-	8.7	6.7	7	33

[a]Mean values of determination made during 1961-1966.

isms were identified to species with the exception of rotifers belonging to genera *Synchaeta* and *Polyarthra*.

RESULTS AND DISCUSSION

GEOGRAPHIC ZOOPLANKTON DISTRIBUTION

Altogether, 58 species were recorded in the course of the investigations (Table 2). The assemblage of species indicated that the planktonic fauna of the area under study was much richer in entomostracan than in rotiferan species. Rotifers were represented by 15 species; crustaceans included *Copepoda* (14 species) and *Cladocera* (29 species). Besides those, members of *Ostracoda* and *Hydracarina*, as well as small *Oligochaeta* and larvae of *Chaoboridae*, were also found in the plankton. Three copepods (*Limnocalanus macrurus*, *Senecella calanoides* and *Diaptomus sicilis*), earlier noted as having been reported from lakes in or near Algonquin Park, were not taken in this study. Nevertheless, these forms were found only in deep lakes, a class not included in this survey.

The majority of the crustaceans identified in the plankton of the study lakes have wide distribution in North American waters. Also, there is nothing to indicate that the zooplankton of the study lakes is much different, at least as far as the crustacean element is concerned, from that of other water bodies. A comparison of our findings, with the available published accounts of the specific composition of zooplankton in other areas of North America, offers evidence of marked similarity (Table 3).

In terms of the crustacean species, the plankton of the study lakes is almost identical to that of the Adirondack region lakes of New York (Hall and Waterman 1968). Of 27 crustacean species reported from lakes of the Adirondack region, 26 were found in the lakes investigated in Algonquin Park. The only crustacean species that occurred in the Adirondack lakes, but was absent from our collection, was *Acroperus harpae*. It had, however, been noted to be distributed throughout Costello Creek by Solman (1939).

A close similarity in crustacean fauna is also evident between our study lakes and the

Table 2. Distribution of zooplankton.

Watersheds	Oxtongue				Opeongo									Petawawa						Madawaska							Bonnechere		
Organisms	Westward	Scott	Little Minnow	Myra	Mykiss	Little Mykiss	Chewink	Shrew	Ryan	Shallnot	Billy	Oram	Redrock	Animoosh	Jack	Sawlog	Pine	Lonesome	Crevice	Major	Little Major	Bruce	Crystal	Hidden	Dove	Fairy
Rotatoria																										
*Kellicottia longispina**	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x
Kellicotta bostoniensis			x		x		x	x	x	x	x	x			x	x	x	x	x	x	x	x		x	x	
Keratella cochlearis (Josse)*		x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	
Keratella quadrata (Mueller)*					x			x	x		x	x				x	x		x	x	x					
Keratella taurocephala°*	x	x	x		x					x	x			x	x	x	x	x			x	x	x	x	x	x
Lecane ohioensis°				x								x														
Trichocerca cylindrica°*			x	x	x	x		x	x	x	x		x			x	x	x	x			x			x	x
*Trichocerca multicrinis**					x	x											x									
Asplanchna priodonta Josse*		x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x		x	x	x		x	
*Ploesoma hudsoni**										x						x								x		
*Ploesoma lenticulare**								x	x																	
Polyarthra spp				x	x			x	x	x	x	x	x	x		x	x		x	x	x				x	
Synchaeta spp	x	x	x	x	x			x	x	x		x			x	x	x		x	x	x					x
Filinia longiseta (Ehrenb)*									x	x							x									
Conochilus unicornis Rousselet*		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Copepoda																										
Epischura lacustris Forbes*	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Diaptomus oregonensis Lillieb*					x	x		x		x		x	x				x	x	x		x			x	x	
Diaptomus minutus Lillieb*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Diaptomus leptopus Forbes°				x	x										x		x	x	x	x	x	x		x		
Diaptomus sanguineus Forbes°													x													
Macrocyclops albidus (Jurine)°					x			x	x					x						x					x	
Tropocyclops prasinus (Fischer)*	x	x	x		x	x	x	x	x	x			x	x		x	x	x	x	x	x	x		x	x	x
Orthocyclops modestus (Herrick)°			x	x	x				x	x						x	x	x	x		x				x	
Eucyclops agilis (Koch)°										x							x	x	x	x					x	
Eucyclops speratus (Lillieb)°			x					x				x												x		
Cyclops scutifer Sars*	x	x	x		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	
Cyclops vernalis Fischer*°								x	x	x	x										x			x	x	
Cyclops bicuspidatus thomasi Forbes*	x		x	x					x	x	x	x	x	x			x	x		x						
Mesocyclops edax (Forbes)*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 2 continued on page 4.

* limnetic species ° littoral species

Table 2. Distribution of zooplankton (continued).

Watersheds	Oxtongue				Opeongo						Petawawa						Madawaska								Bonnechere		
Organisms	Westward	Scott	Little Minnow	Myra	Mykiss	Little Mykiss	Chewink	Shrew	Ryan	Shallnot	Billy	Oram	Redrock	Animoosh	Jack	Sawlog	Pine	Lonesome	Crevice	Major	Little Major	Bruce	Crystal	Hidden	Dove	Fairy
Cladocera																										
Sida crystallina (Mueller)°	x				x	x		x	x		x	x		x										x		
Diaphanosoma brachyurum (Lieven)*			x	x	x	x	x	x	x	x	x	x	x	x		x	x	x		x	x	x		x	x	x
Latona setifera (Mueller)°					x						x															
Holopedium gibberum Zaddack*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Daphnia pulex de Geer°	x										x							x	x							
Daphnia schoedleri Sars*°								x	x	x	x	x	x						x	x						
Daphnia catawba Cocker*°	x	x	x	x	x	x			x	x	x	x				x	x	x	x		x		x			
Daphnia retrocurva Forbes*			x			x	x	x	x			x	x	x		x	x	x	x			x		x	x	x
Daphnia ambigua Scourfield*°			x					x	x		x	x	x	x		x	x	x								
Daphnia longiremis Sars*	x	x			x								x	x	x		x		x	x					x	
Daphnia rosea Sars°					x			x							x											
Daphnia dubia Herrick*	x				x			x	x	x	x	x	x			x	x	x	x	x	x			x		x
Daphnia galeata mendota Sars-Birge*	x	x			x			x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	
Simocephalus vetulus (Mueller)°										x																
Ceriodaphnia quadrangula (Mueller)°									x																	
Ceriodaphnia lacustris Birge*								x																	x	
Bosmina longirostris (Mueller)*°	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Bosmina coregoni Baird*	x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	
Iliocryptus sordidus (Lieven)°											x															
Acantholeberis curvirostris (Mueller)°																			x							
Ophryoxus gracilis Sars°										x	x															
Eurycercus lamellatus (Mueller)°						x					x															
Alona rectangula Sars°					x			x																	x	
Alona affinis (Leydig)°								x	x	x																
Chydorus bicornutus Doolittle			x																							
Chydorus sphaericus (Mueller)°			x		x			x	x	x	x	x		x		x	x	x			x				x	
Chydorus faviformis Birge			x																							
Polyphemus pediculus (Linne)°	x			x	x		x	x	x		x	x	x			x		x	x		x					
Leptodora kindtii Focke*	x		x	x	x		x	x	x	x	x	x	x	x						x			x			x
Others																										
Chaoboridae larvae	x	x	x	x		x		x	x	x			x			x	x	x	x	x	x	x	x	x	x	
Acarina	x	x	x	x	x			x	x			x	x		x				x		x		x	x	x	
Oligochaeta				x	x				x		x															
Ostracoda																										

* limnetic species ° littoral species

Table 3. Number of crustacean species in common between study lakes and some other waters.

Lakes	Number of species		References
	Identified	In common with lakes of Algonquin Park area	
Adirondack lakes, N.Y.	27	26	Hall and Waterman, 1968
Finger Lakes, N.Y.	29	24	Hall and Davey, 1967
Lake Ontario	20	17	Patalas, 1969
Lake Erie	20	16	Davis, 1969[a]
Lake Michigan	17	13	Wells, 1960
Heming Lake, Manitoba	26	19	Lawler and Watson, 1958
Charlotte Co. lakes, N.B.	14	13	Smith, 1952
Great Slave Lake	21	15	Rawson, 1956
Lake Nipigon, Ontario	27	19	Bigelow, 1928[b]
Four Canadian lakes	28	18	Reed, 1962[c]

[a] Exclusive *Copepoda harpacticoida*.
[b] Limnetic species and species of protected bays associations only.
[c] Exclusive lakes of Labrador and Northwest Territories.

Finger Lakes, New York. Of 29 crustacean species reported for the Finger Lakes (Hall and Davey 1967), 24 were found in the Algonquin Park study area.

The crustacean plankton in the study lakes also had much in common with that of the brook trout lakes in Charlotte County, New Brunswick (Smith 1952). Of 14 species reported for those lakes, 13 were found to be present in our study lakes.

An evident similarity in the occurrence of crustacean species was also found between the study lakes and Heming Lake in Manitoba (Lawler and Watson 1958). Of 26 crustacean plankters recorded there, 19 were found in our investigations.

Rotatoria:

Nearly all rotifers identified were limnetic and usually typical of the open-water plankton of the lakes. The exceptions are *Lecane ohioensis*, which is a true littoral form, and *Trichocerca cylindrica*. The latter, as well as *Keratella taurocephala* and a few other species discussed further, apparently cannot be defined as either strictly limnetic or littoral species. According to Hutchinson (1967), *Trichocerca cylindrica* is a "more or less" limno-planktonic species. In some other published records, however, it is listed as an inhabitant of the inshore localities: Bigelow (1928) has established that it was characteristic of the "zone of vegetation in protected bays" of Lake Nipigon; Sachse (1909) described it as a form occurring in shallow water.

Keratella taurocephala is known to inhabit a variety of habitats from acid sphagnum bogs and ponds to lakes and is "apparently an acidobiont" (Ahlstrom 1943).

No information was available in the published records on hand regarding the ecological nature of *Kellicottia bostoniensis* except Carlin's statement (1943) that outside North America this species was found in a lake in Sweden, the water of which was acidic and lacked oxygen. Judging by its distribution in lakes of Algonquin Park and in some other waters in which observations on zooplankton have been carried out by the senior author, this species is a regular component of the plankton in the open-water parts of the lakes.

Copepoda:

The assemblage of copepod species in the study lakes was found to be a mixture of limnetic and littoral plankters. The limnetic element was represented by seven species, the littoral by six. One copepod, *Cyclops vernalis*, was classified by some authors as limnetic (Ward and Whipple 1918), by others as a species of shallow waters (Rawson 1956).

Cladocera:

Cladocerans found in the lakes studied were represented by 14 species typical of littoral and shallow-water localities and by 11 of limnetic nature. According to Brooks (1957), *Daphnia catawba* and *Daphnia ambigua* are lake dwellers but occur also in pond plankton, and *Daphnia schoedleri* is typically a pond plankter but occasionally is present in some lakes. *Bosmina longirostris* is generally considered to

be a limnetic species (Pennak 1953), although it occurs also in pools, ponds and in the littoral zone of the lakes (Ward and Whipple 1918; Southern and Gardiner 1926). Wilson (1929) reported that in Lake Erie it occurred more commonly near the shores.

The distribution of the various species can be seen in Table 2. The most widespread plankters in the area were *Diaptomus minutus*, *Mesocyclops edax* and *Holopedium gibberum*, which were recorded in the plankton of every lake investigated. Of wide distribution in the study lakes were also *Bosmina longirostris*, which occurred in 25 out of 26 lakes, *Conochilus unicornis*, which was observed in 24 lakes, and *Kellicottia longispina* and *Epischura lacustris* which were found in 23 lakes. *Keratella cochlearis*, *Asplanchna priodonta*, *Tropocyclops prasinus* and *Diaphanosoma brachyurum* were recorded in 21 lakes. Nearly all species which appeared to have a wide distribution in the investigated lakes are limnetic representatives of the plankton. The majority of the species which were found to be restricted to a few lakes only, were plankters usually typical of the littoral habitats. In our samples taken from the open-water parts of the lakes they were, therefore, naturally only of incidental occurrence.

SEASONAL CHANGES

No major seasonal changes in species composition were evident. Most of the plankters persisted throughout the whole period of the observations, so that there was no marked seasonal succession of the species. Nevertheless, the following species were absent, as a rule, from the early spring samples. *Holopedium gibberum* was never seen in March. It made its appearance first in April collections and became abundant during the summer months. *Asplanchna priodonta* generally was absent in March samples, first appearing in the plankton in April and, in some lakes, not until May. In Sawlog Lake, however, single individuals of this species were found in March in 1967. *Mesocyclops edax* also was absent from March collections, except in Major and Ryan Lakes in 1967 and 1968.

Although no quantitative analysis of the plankton was carried out, it was possible to consistently trace certain obvious seasonal changes in relative abundance of species, and to determine the time of the occurrence of the peak of their abundance. The occurrence and the duration of the maxima of zooplankton abundance varied markedly from lake to lake (Table 4), and without obvious correlation to the physical

Table 4. Number and timing of maxima of zooplankton abundance.

Lakes	One maximum, duration		Two maxima	
	One month	Two months	I maximum	II maximum
Animoosh	June			
Jack	July			
Little Minnow	July			
Redrock	July			
Mykiss	Sept.			
Crevice	Oct.			
Pine	Oct.			
Shallnot	Oct.			
Myra		July-Aug.		
Oram		July-Aug.		
Ryan		July-Aug.		
Billy			June	Aug.
Shrew			July	Oct.
Westward			July	Sept.

Table 5. Distribution of "dominant" (x) and "subdominant" (o) plankters in some study lakes.[a]

Organisms	Westward	Scott	Little Minnow	Myra	Mykiss	Shrew	Ryan	Shallnot	Billy	Oram	Redrock	Animoosh	Jack	Sawlog	Pine	Lonesome	Crevice	Major	Little Major	Dove
Epischura lacustris	o							o	o											
Diaptomus minutus	x	x	x	x	x	x	x	x	o	x	x	x	o	x	x		x	x	o	
Diaptomus oregonensis										x										o
Diaptomus leptopus				x													x		x	
Diaptomus sanguineus											o									
Cyclops scutifer	o	x	o		x	o	x		o	x		o	x			o	o	x		
Cyclops bicuspidatus thomasi	o																			
Mesocyclops edax						o	o						o							
Tropocyclops prasinus						o		o												o
Diaphanosoma brachyurum				o						o										
Holopedium gibberum	x		x	o	x	x						o	x	x	x	x				o
Bosmina longirostris								o							o				o	
Bosmina coregoni	o					o							o							
Daphnia schoedleri							o			x								o		
Daphnia catawba			o	x			o		x					o	o		x			
Daphnia retrocurva												x								
Daphnia longiremis		o			o							o					o			
Daphnia dubia	o					o											o			
Daphnia galeata mendota						x	x		x	x	x		x					x		
Asplanchna priodonta								o			o			o	x	x	o			o
Conochilus unicornis				o	o				o		o							o		
Chaoborus larvae								x			x									

[a] The term "dominant" species is applied here to the plankters which in a given lake were regularly present in high abundance. Species which exhibited only sporadic pulses and were only momentarily observed in high abundance will be called "subdominant".

characteristics of the lakes (Table 1). In some lakes, there was only one conspicuous maximum of zooplankton abundance, usually lasting about one month in duration. In Animoosh Lake, the maximum zooplankton abundance occurred in June in 1967. In Little Minnow, Jack and Redrock Lakes, maxima were observed in July each year. In Mykiss Lake, the maximum occurred in September; in Shallnot, Pine and Crevice Lakes, maxima were recorded in October. In Shallnot Lake the maximum occurred only in 1967; in both Pine and Crevice Lakes the maxima were observed in 1966 and 1968.

In Myra, Ryan and Oram Lakes, there was also only one zooplankton maximum, but it was more prolonged (of at least two months duration). Each year, these maxima were formed in July and zooplankton continued to be abundant throughout August. In Billy and Shrew Lakes, two distinct peaks of zooplankton abundance were observed every year. In Billy Lake the maxima were recorded in June and August; in Shrew Lake, in July and October. There also were two peaks of zooplankton abundance in Westward Lake, but they were noted in July and October of 1967 only. Some lakes (Lonesome, Major and Scott) did not exhibit any well defined maxima.

The distributional plankton records indicate that in certain lakes some species occur in high abundance at the same time and dominate all the remaining species present in the samples. The most prominent plankters regularly occurring in high abundance are listed in Table 5. Several distinct combinations of dominating species were apparent in certain lakes.

While similarities in zooplankton occurrence and abundance were noted among some lakes, in general there was considerable variation with respect to the location as well as the timing of the maxima of abundance of individual species in individual lakes.

Seasonal changes in the abundance of a species were not found to parallel those of the same species in other lakes. The same species appeared to behave differently in different lakes despite the fact that these lakes were similar to one another in some of their characteristics (size, maximum depth, mean depth, transparency).

Such variations in the maxima of abundance, as for instance in *Asplanchna priodonta* which formed a maximum in Dove Lake in June (1967), in Redrock Lake in September (1966, 1967) and in Crevice and Sawlog Lakes in October (1966, 1967), cannot be explained on the basis of the information available. Neither is it obvious why the peak of abundance of *Bosmina coregoni* occurred in Westward Lake in June (1967), in Jack Lake in July (1967), and in Shrew Lake in October (1967, 1968). Similarly, differences in the duration of the maxima of abundance were found in a number of other species. It will suffice to mention *Daphnia dubia* which persisted each year in the plankton of Crevice Lake in high abundance throughout July and August, but reached a maximum in Westward Lake in September of 1967 and in Shrew Lake in October of the same year.

Interpretation of these divergences will require a more detailed study of the environmental conditions in each lake, especially a thorough investigation of the physical-chemical properties and the biological conditions. In this respect, the present report can serve as a basis for future zooplankton investigations in the lakes under consideration.

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